

CLAIMS:

1. A suture needle assembly, comprising a suture needle and an activatable sheath.
2. The suture needle assembly of claim 1 wherein said sheath is activatable by
5 electricity.
3. The suture needle assembly of claim 1 wherein said sheath is activatable by heat.
4. The suture needle assembly of claim 1 wherein said needle comprises a first
10 tissue penetration end and a second end for suture attachment, an external casing and an internal compartment, an outer surface along a longitudinal axis of said external casing, a sheath activator disposed inside said casing and electrically or thermally responsive to said casing, and said activatable sheath operatively connected to said sheath activator; wherein a portion of
15 said sheath is capable of reaching a protective position proximal to said first end of said needle.
5. The suture needle assembly of claim 4 wherein said sheath activator comprises a shape memory alloy component.
6. The suture needle assembly of claim 5 wherein said shape memory alloy component is nitinol.
- 20 7. The suture needle of claim 4 wherein said sheath further comprises a catch point, notch, or securing means for maintaining said sheath in an activated position upon activation.
8. The suture needle assembly of claim 4 wherein said sheath activator comprises a shape memory plastic component.
- 25 9. The suture needle assembly of claim 4 wherein said sheath comprises a shape memory alloy or shape memory plastic.
10. The suture needle assembly of claim 4 further comprising an initiator of said sheath activator, wherein said activator is capable of receiving energetic exposure from said initiator.

11. The suture needle assembly of claim 10 wherein said initiator comprises a source of heat or electricity.
12. The suture needle assembly of claim 4 wherein said activatable sheath and said activator are unitary.
- 5 13. The suture needle assembly of claim 4 further comprising an extension shaft connected at a first end to said activator and connected at a second end to said sheath.
14. The suture needle assembly of claim 1 wherein said activatable sheath is reversibly capable of activation.
- 10 15. The suture needle assembly of claim 14 wherein said reversibly activatable sheath is provided in an initially armed configuration.
16. The suture needle assembly of claim 14 wherein said reversibly activatable sheath is provided in an initially disarmed configuration.
17. The suture needle assembly of claim 1 wherein said activatable sheath
15 comprises a hood-shaped shield.
18. The suture needle assembly of claim 1 wherein said activatable sheath comprises a cylindrical projection.
19. The suture needle assembly of claim 1 wherein said activatable sheath comprises a loop.
- 20 20. The suture needle assembly of claim 1 wherein said needle comprises a sheath receiving aperture.
21. The suture needle assembly of claim 20 wherein said sheath receiving aperture is a groove or notch.
22. The suture needle assembly of claim 1 wherein said activatable sheath is
25 capable of assuming a retracted position that is substantially flush along a needle outer surface.
23. A suturing apparatus comprising a suture needle assembly of any of claims 1-22 and a needle holder.
24. A suturing apparatus comprising a suture needle assembly of any of claims 4-
30 22 and a modified needle holder; wherein the modified needle holder

- comprises a first holding tip and a second holding tip, and the first and second holding tips are energetically connected to an energy source; and wherein the first holding tip and second holding tip are capable of contacting a first and a second needle assembly energy contact surface, wherein said contact surfaces are energetically contacted to said activator of said needle assembly, and wherein said holding tips are capable of delivering energy to said contact surfaces.
- 5
25. The suturing apparatus of claim 24 wherein said energy source is electricity.
26. The suturing apparatus of claim 24 wherein said energy source is heat.
- 10 27. The needle assembly of claim 4 wherein said external casing comprises a first outer surface portion and a second outer surface portion capable of forming an electrical circuit.
28. A method of reducing a probability of an accidental suture needle puncture event comprising; providing a safety suture needle of any of claims 1-22, performing a suturing procedure, activating an electrically or thermally responsive sheathing mechanism of said needle so as to move a sheath of said needle into a protective position with respect to a sharp tip of said needle; thereby reducing a probability of an accidental suture needle puncture event.
- 15
29. A method of suturing, comprising providing a safety suture needle of any of claims 1-22, and performing a suturing procedure with said safety suture needle.
- 20
30. A modified needle holder, comprising a needle holder having a first holding tip and a second holding tip, each electrically connected to a power source and capable of delivering electricity.
- 25
31. The modified needle holder of claim 30, further comprising a control switch or means for circuit regulation.
32. A suturing kit comprising the suture needle assembly of any of claims 1-22 and suture material.
- 30 33. A suturing kit comprising the suture needle assembly of any of claims 1-22, a needle holder, and suture material.

34. A suturing kit comprising the suture needle assembly of any of claims 1-22, a modified needle holder of claim 30, and suture material.
35. A suture needle comprising a unifying element, wherein the unifying element is either continuously connected to a needle casing or connected at multiple points thereto, wherein said unifying element comprises a shape memory material component and is capable upon a fracturing event of said needle casing of preventing dissociation of a needle part from another needle part or the remainder of the needle body.
36. The suture needle of claim 35 wherein the shape memory material component is nitinol.